TECHNOLOGY DEPT.

15¢

January 22, 1949

SCIENCE NEWS LETTER

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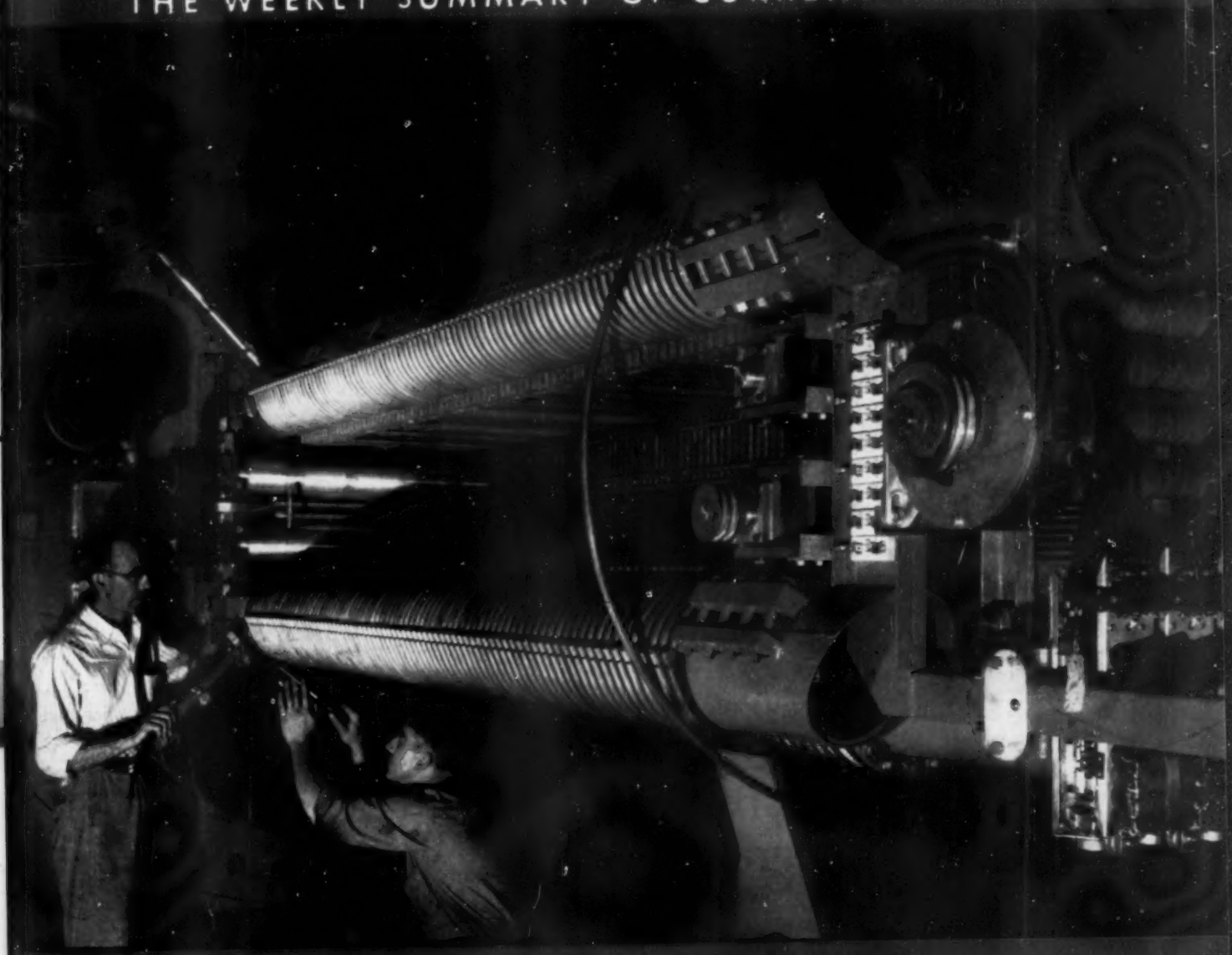
THE WEEKLY SUMMARY OF CURRENT SCIENCE



Atom Smasher

See Page 57

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TECHNOLOGY DEPARTMENT

GENERAL SCIENCE

GI Scientists Surveyed

Recommendation that some national agency be empowered to allocate and assign scientists to jobs they are best suited for in event of war was made.

➤ IF THE scientists who served in uniform in the last war had their way, the present selective service system would not be used to utilize scientists in the armed forces in another emergency.

Only two out of nearly 5,000 scientist-soldiers who joined in a two-year study made for the General Staff of the Army would use selective service as is to recruit scientific manpower. Over half strongly recommended some national agency to allocate and assign the scientists to jobs they could best do in war, whether in uniform or civies.

The Army survey, directed by Dr. David M. Delo, under the title SCIENTISTS IN UNIFORM was aided by 31 scientific societies, many of which sent questionnaires to their members.

The complaints registered by the soldier-scientists are not merely normal G.I. gripes. Suggestions are made for the future.

An undesirable onus was placed upon scientists deferred for important research work, the report says, although civilian scientists were better utilized in the war than the uniformed scientists. Steps should be taken to keep young scientists from rushing into the armed services as volunteers pressured by public opinion and draft uncertainties. This would "probably be to the detriment of the over-all war effort."

Top physical fitness should not be required for professional scientists on technical jobs, the survey found. Age should not be a barrier to many non-combat services.

Make every working scientist responsible for service in the national interest no matter what his age or physical constitution, the experts recommend. Don't allocate them again in an emergency by lot, age group, or local bulk quotas.

Unrealistic draft policies in World War II as well as the present demand for trained scientists are blamed for severe shortages of men in some scientific fields today.

To plan realistically for either future war or future peace, the study concludes, a national agency to evaluate present and potential supply of scientists is needed. This catalog or roster should be operated through the agency of scientific and engineering societies.

The armed services had no adequate mechanism for effective utilization of professional engineers and scientists who remained in the ranks as enlisted men, the survey showed. Many scientists served in non-technical assignments in military service, although at the same time other organizations were crying for technical assistance and personnel.

A scientist or engineer who was drafted or voluntarily enlisted had only two chances in ten of utilizing his technical background at his level of competence, a reserve officer three in ten chances, and those directly commissioned from civil life four in ten chances.

Science and technology were not applied as effectively as they could have been to the prosecution of the war, the survey concludes, on the basis of what happened to the scientists in uniform.

Maj. Gen. A. C. McAuliffe, Deputy Director of the Army's Research and Development, declared in the report:

"Science and scientists are vitally important to modern military functions. Success in any future war will depend as much on the effective use of all the scientific resources of the Nation as upon efficient industrial mobilization or skillful command of the fighting forces.

"Scientists constitute an exceedingly small segment of the national population. They compose less than 2 percent of the Armed Forces, but the military functions dependent on their specialized skills and knowledge are highly disproportionate to their numbers. The small numbers involved and the great complexity of scientists' experience and training require the use of special measures to assure their maximum utilization."

What the scientists of the nation must do in any future war is told in the report in six points:

1. The Military Services must be supplied with an adequate number of professional scientists and engineers, both civilian and uniformed, to perform their technical missions.

2. Adequate numbers of physicians and supporting personnel such as radiologists, bacteriologists, and sanitary engineers, must be reserved in civilian status to maintain the national health.

3. A sufficient number of civilian engineers and scientists must be assigned to operate communication and transportation systems, and light-and-heat facilities.

4. Industry must utilize scientific manpower to carry on research, development, testing, and production to support the war effort and the civilian economy.

5. Various nonmilitary governmental agencies must continue their scientific activities.

6. Educational activities must be continued on a reduced but significant scale so that we do not sacrifice the long-range welfare of the country to short-range needs.

Science News Letter, January 22, 1949

AERONAUTICS

Russia's New Jet Planes

➤ THE Soviet Air Force is concentrating on fast interceptor jets and four-engined jet bombers, ORDNANCE (Jan.-Feb.), official journal of the American Ordnance Association, states. Sufficient information has leaked from behind the Iron Curtain to permit experts to appraise the Soviet air arm.

Russia's use of its air arm in another war would be far different from the applications in the past war. In it, the air force was an arm of the land force and was employed with heavy-caliber machine guns to play hob with German supply lines, troop concentrations, and fighter landing fields behind the lines. The speedy fighters and long-range heavy bombers now under construction and in use indicate Soviet preparation to be able to carry destruction to an enemy's home country.

The available information from Russia shows that the Reds have gone all out for jet propulsion, just as have the British and Americans. New planes have a distinct German flavor in their design. This is to be expected because the Russians took all the Nazi aircraft factories and engineers they could find in the closing days of the war and moved them into Russia proper. Included also were many plans for projected jet- and rocket-powered military aircraft.

The Yak jet-fighter is one of the most interesting aircraft of the type produced in postwar Russia. It resembles the American Air Force Republic Thunderjet F-84 very closely. It is claimed to be in the 650-mile-an-hour class. It is supposedly powered with the British Nene jet engine, a Rolls-Royce product. An American version of this same engine, constructed by Pratt and Whitney, will be in use soon in Navy, Grumman-Panther, carrier-based, jet fighters.

The Soviet Ilyushin four-jet bomber resembles the American Boeing B-47. Its engines are underslung on struts below its thin wings. It has a B-17-type tail turret and it carries its main landing gear in the fuselage, thus simplifying the thin-wing design.

Of special interest to Americans is the Soviet version of the famous B-29 Superfortress, four of which came into Russian hands during the war. It is the Soviet TU-70. In conformation, it looks like the B-29, and many of its component parts are obviously exact duplicates.

Science News Letter, January 22, 1949

PSYCHIATRY

Anti-War Prescription

The nation's psychiatrists suggest ways to relieve the present dangerous psychological features which are producing international tensions.

➤ AN ANTI-WAR prescription has been written by the nation's psychiatrists.

As medical doctors, they see war as a plague. Their prescription for stopping it calls for, among other things, mutual confidence between leaders of the people in all countries.

The anti-war prescription also calls for each nation to examine rigidly its own motives and for national leaders to watch out for their own personal feelings of hate. Such feelings of aggressive hostility are present to some extent in everyone. Leaders of a nation particularly need to "sublimate" them, that is, to transform such feelings into constructive action.

Part of the psychiatric anti-war prescription calls for both leaders and the general public to support the World Health Organization and UNESCO.

The prescription was written by a committee of the American Psychiatric Association under the chairmanship of Dr. George H. Stevenson, superintendent of Ontario Hospital, London, Ont. Dr. William C. Menninger of Topeka, Kans., is president of the association and Dr. Daniel Blain, of Washington, is its medical director.

In a statement addressed both to the general public and national leaders in all countries, the association points out that "emotions of fear and greed, cultivated to unhealthy degrees, can lead only to delusions of persecution, to hostile aggression (defensive and offensive) and ultimately to World War III. They state in part:

"The American Psychiatric Association is seriously concerned about the unfortunate psychological features which are a part of the present international tensions. It believes it has a duty to offer a statement on these matters for the attention of national leaders in all countries and for the general public, whose health and welfare are intimately related to international tensions.

"The American Psychiatric Association makes this statement because psychiatrists strive to understand the psychological causes of difficult and faulty interpersonal relationships and should be able to offer some advice on their improvement. Such knowledge and advice should be applicable whether the adjustment difficulties are between individuals or groups of individuals, even national groups of individuals.

"We would point out that mutual confidence between leaders of the people in all countries, combined with mutual honesty, mutual forbearance, mutual support—positive healthful attitudes, conveyed from the leaders to their followers—should lead to a higher, better and healthier civilization than any we have known in the past.

"It should be pointed out, too, that the elimination of war as a public health menace can only be achieved by rigid self-scrutiny of national motives, by the refusal to accept or give spurious rationalization for unfriendly behavior, and by conscious achievement of sublimation of the leaders' personal aggressive hostility, which is present to some extent in everyone.

"For the development of better mental health citizens of various countries, the United Nations has set up subsidiary agencies which should be valuable in attaining this objective. One of these is the World Health Organization, which is concerned with the best possible health of people in its physical, mental and social aspects. Another organization is UNESCO, one of whose objectives is the solution of social tensions, including international tensions, by the efforts of the social scientists in all countries, pooling their knowledge, experience and effort. The American Psychiatric Association urges national leaders and the general public to support both of these organizations in their efforts to provide better mental health between nations."

Science News Letter, January 22, 1949

JET POWER UNVEILED—This is the first released photograph of the General Electric TG-180 (Allison J-35) jet engines which power the Martin XB-48 six-jet plane. Three jet engines are mounted in each wing of the Air Force bomber. Cowling on two of the engines have been raised to permit inspection and give some idea of how 4,000 pounds of thrust is produced by each engine.

ENGINEERING-CHEMISTRY

Liquid Hydrogen Motor

➤ THE hydrogen that carries balloons to great heights may some day take rockets into the outer space beyond the pull of gravity. But it will be liquid hydrogen, and the rocket will carry liquid oxygen to permit combustion. The liquid hydrogen is the fuel; the liquid oxygen is the oxidizing agent.

A rocket motor utilizing liquid hydrogen and liquid oxygen has been in experimental use at the Ohio State University in Columbus, O., for over a year. This test motor, no larger than a human hand, produces a thrust higher than that developed by the engine of the average small airplane. Its exhaust jet nozzle emits gases at a speed of around 15,000 miles an hour.

Hydrogen is said to be the most powerful chemical fuel known to science. When it is cooled to 423 degrees below zero Fahrenheit, it becomes a liquid at atmospheric pressure. Making liquid hydrogen is not an easy process; this temperature is only approximately 37 degrees above the probably unobtainable absolute zero, where all motions of the hydrogen molecules are supposed to cease.

Calculations show that liquid hydrogen, used in combination with an efficient oxidizer, such as liquid oxygen, will provide sufficient energy to accelerate a vehicle to the speed required to break away from the earth's gravitational pull, scientists at the university state. Rockets using liquid hydrogen are therefore the type that may be used to reach the moon, or to move around the earth like a satellite.

The liquid hydrogen motor was an achievement of the university's Cryogenic Laboratory, under the direction of Prof. H. L. Johnston, who developed low temperature research at the institution, and Marvin L. Stary, chief engineer of the motor project. The laboratory has advanced facilities for liquefying hydrogen, and also to produce liquid helium, the most difficult gas to liquefy. Other laboratories are experimenting with liquid hydrogen for power, but Ohio State claims the distinction of originating the use of liquid hydrogen as a rocket motor fuel.

Science News Letter, January 22, 1949

ANIMAL HUSBANDRY

Breed Better Livestock

➤ HOGS with more ham and bacon—and less lard—better beef cattle and hybrid chickens that produce more eggs are all on the way.

These menu-bound developments were disclosed in the annual report of Dr. B. T. Simms, chief of the U. S. Department of Agriculture's Bureau of Animal Industry.

Hogs with higher percentages of the preferred cuts (ham, loin, bacon, picnic shoulder and shoulder butt) are the result of breeding Danish Landrace swine with better known American breeds. Best bet, thus far, is a cross between the Landrace and the Poland China breed. Other American breeds are also being used in the experiments at Beltsville, Md., and elsewhere.

Discovery that beef calves' feed-lot gains and weight at 15 months are inherited to an important extent may help develop bigger beef supplies for the future.

Crossbred hens with Rhode Island Reds and White Leghorns produced more eggs than either of the parent breeds. Hybrid chickens may mean for egg production what hybrid seed has meant to corn production, the report indicated.

Meanwhile, on the Mexican battle front, scientists have succeeded in confining foot-and-mouth disease to a slightly smaller area, the report stated. This is good news to Americans whose beef supplies might be seriously cut if the dread disease were to reach across the border into the Southwest.

A laboratory established in Mexico by American and Mexican scientists produced 1,750,000 doses of vaccine last month for use in vaccinating Mexican cattle.

Science News Letter, January 22, 1949

Letters To The Editor

Tales of Hoarding

➤ THE "Nature Ramblings" article in SNL Dec. 11, on the hoarding habits of some birds, suggests a variant of the same story I have heard for many years about the California woodpeckers, particularly in Tulare County. One of the difficulties a number of years ago, and it possibly still exists, was that woodpeckers riddled electric and telephone poles, and inserted hundreds of acorns into the holes. A few months later the woodpeckers would return to find a juicy worm inside. Most often they pecked out the worm and left much of the acorn meat still in the shell. Many of the holes would be cleaned out by removing the acorn hulls, so that the same holes could be used again the next year.

The woodpecker apparently uses this method to select a portion of food for his exclusive use, then eats it in his own sweet time. Do you suppose the bird knows that by so doing he is cultivating a crop of animal food from his vegetable food and does it on purpose? If so we would have a good example of Brer Woodpecker playing Food Technologist, converting vegetable material into animal fats, proteins and vitamins which, to my way of thinking, is really something. You could delight many of us with other examples of animals who practice agriculture and animal husbandry. —W. Tresper Clarke, Brooklyn, N. Y.

There seem to be two schools of thought among zoologists, about the foresightedness of the California woodpecker in providing a future supply of worms for himself. Undoubtedly he does eat the worms that appear in his stored acorns, but whether or not he anticipates their appearance when he stores the acorns is the moot point. It may well be that the only one competent to give an authoritative answer would be the woodpecker!

Did you ever read Mark Twain's uproarious account of the bluejay that found a hole in a cabin wall, and tried to fill the whole cabin with acorns? Although told as a broadly humorous tale, it is actually a good account of the hoarding urge running wild.

Science News Letter, January 22, 1949

Question Box

AERONAUTICS

How has Russia's attitude changed toward her air force? p. 50.

AGRICULTURE

What are some of the foods of tomorrow coming out of the laboratory? p. 55.

CHEMISTRY

What new qualities have been added to cotton? p. 54.

GENERAL SCIENCE

What were some of the complaints registered by scientist-soldiers? p. 50.

MEDICINE

Clues to what diseases may come from research on blood? p. 60.

What device aids the surgeon in finding gallstones? p. 53.

PSYCHIATRY

What recommendations have been made to avert war? p. 51.

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GENERAL SCIENCE

Science Foundation Bill

For the third consecutive year President Truman has included a foundation bill in the budget. A total of $15,000,000 for fiscal 1950 has been listed for it.

➤ PRESIDENT TRUMAN included a national science foundation in the budget for the third consecutive year and called on Congress to establish the new civilian agency for directing federal support of science.

Scientists, frustrated after three years of legislative and executive disagreement, are hopeful that the new election-borne weight now given the President's words will help bring the long-sought foundation into being. A total of $15,000,000 for fiscal 1950 for the foundation to start its program is listed in the budget.

A bi-partisan bill, identical with one which passed the Senate and died in the House of Representatives last year, has already been introduced in the Senate. Heading the list of senators who introduced the bill (S. 247) is the new chairman of the Labor and Public Welfare Committee where the bill has been assigned, Sen. Elbert D. Thomas, D., Utah. Other sponsors include two other Democrats, Sens. Harley M. Kilgore, W. Va., and J. William Fulbright, Ark., and three Republicans, H. Alexander Smith, N. J., Guy Cordon, Ore., and Leverett Saltonstall, Mass.

The bill was originally sponsored in the Republican Eightieth Congress by Sen. Smith. It meets the objections the President raised in 1947 when he killed a foundation bill by pocket veto. Main objection at that time was appointment of the director of the foundation by a large group of members. Under the present bill, the President appoints both the director and the members, with advice and consent of the Senate.

The foundation's big jobs are planned to be the support of research, particularly fundamental research, with grants of federal funds and the awarding of scholarships and fellowships to scientists and prospective scientists. As called for in the bill, it would fun tion through divisions covering different sciences. A minor point of dispute in the last Congress was whether special groups should be specified for attacks on major diseases, but this was compromised by providing that the foundation could set up such other divisions and commissions as it deemed advisable.

Dr. Vannevar Bush, president of the Carnegie Institution of Washington, first proposed the foundation as a civilian, peacetime successor to the successful Office of Scientific Research and Development which he headed in World War II. OSRD passed out of existence, but the new foundation failed to be enacted into law, twice dying in Congress and once at the White House.

Meanwhile, the burden of the support of the fundamental research which everyone has agreed is vital to the country for peace as well as war has fallen chiefly to military organizations, such as the Office of Naval Research.

Most scientists today will be satisfied to get any foundation bill written into law, so that the new organization can finally start its task, more than three years after the war. Some, however, would like to see some changes made in the present bill. Most of these would be in the direction of more power for the foundation, and particularly the director.

One argument being advanced is that the new Congress need not be hesitant about changing the Republican "Smith Bill" of last year, which is identical with the new one. Some scientists even suggest they would prefer the bill which Sen. Thomas himself introduced in the last session.

But most scientists are merely hopeful that the foundation, which has almost unanimous support from science and education, will finally be established.

Science News Letter, January 22, 1949

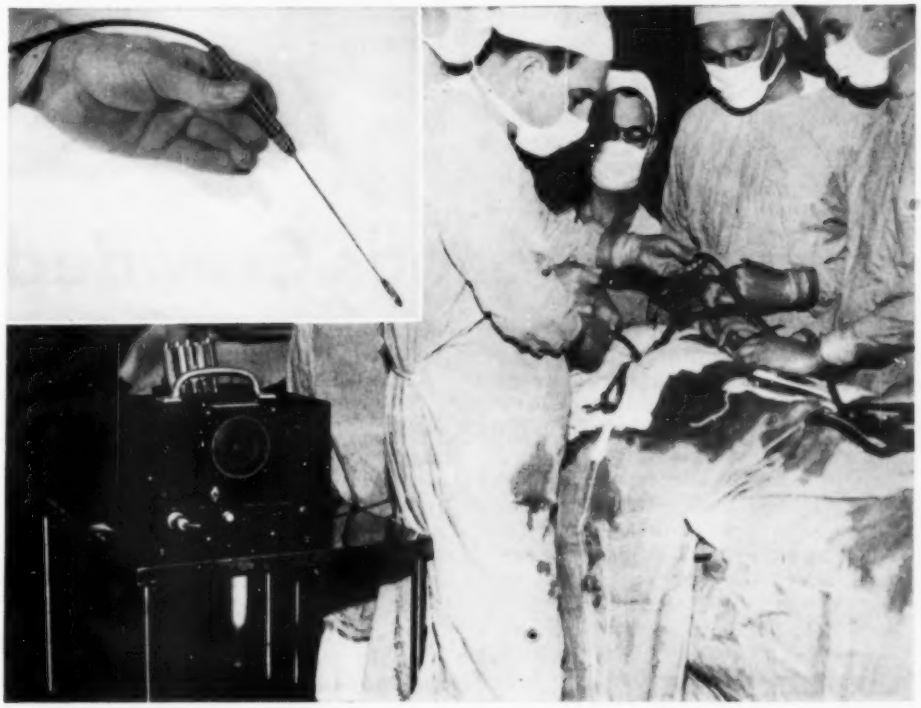
MEDICINE

Find Gallstones by Sound

➤ GALLSTONES hiding in the common bile duct after the surgeon thinks he has removed them all can now be made to broadcast their presence to the surgeon or to the entire surgical team. They will do it through a gallstone detector developed by Dr. Eric A. Walker and E. G. Thurston, of the Ordnance Research Laboratory, Pennsylvania State College, for Dr. C. K. Kirby of the University of Pennsylvania Hospital.

The detector is something like a phonograph pickup. It consists of a standard surgical probe held in a chuck, or handle, which contains a glenite ceramic piezoelectric element. Sound waves travel through the probe to the crystal and are there turned into small electric currents which are carried by means of a telephone cable to an amplifier. This amplifies the small electric current and changes it back to sound energy in the loud-speaker. Or the amplifier may be connected to earphones for the surgeon to wear.

By this combination the very slight sounds of the probe striking a tiny gallstone are



GALLSTONE DETECTOR—Amplifier at left emits a sound when the probe in insert comes in contact with a gallstone.

amplified hundreds of thousands of times. Besides the increased sensitivity of the instrument over present equipment, the device has the advantage that extraneous noises, such as the handle striking solid objects, are largely eliminated.

The Penn State researchers, who ordinarily do work for the U. S. Navy, are now working on a similar device to detect kidney stones.

The college will place the gallstone detector on the open market, passing up patent claims, Dr. Walker said, so that it may be made available to the greatest number of people needing this medical aid.

Science News Letter, January 22, 1949

CHEMISTRY

Cotton Gets New Qualities

New chemical processes make treated cotton soak up more water, give it greater rot resistance, and increase the range of dyes it is able to absorb.

➤ CHEMISTS are teaching cotton new tricks:

it can soak up more water.

It has greater rot resistance.

It can take a wider range of dyes.

The rapidity with which cotton cloth soaks up water is increased through a new chemical treatment. This suggests its possible use on toweling and similar materials, according to the annual report, just issued, of the U. S. Department of Agriculture's Bureau of Agricultural and Industrial Chemistry. The treatment consists of tacking onto the cellulose molecule a group of atoms related to ordinary wood alcohol, called carboxymethyl.

A new type of cotton fabric, known as aminized cotton, is produced by a chemical finishing process recently developed at the Southern Regional Laboratory. This cotton, unlike ordinary cotton, has the ability to take acid wool dyes readily.

The process, which greatly increases the range of usable dyes, consists of allowing 2-aminoethylsulfuric acid to react with the cellulose of the fabric in a strongly alkaline solution, whereby amino groups are chemically combined with the cellulose. It is simpler and less expensive than other procedures proposed for the same purpose.

The introduction of amino groups permits the addition of metallic elements to give rot resistance or the introduction of organic groups to give water repellency or other new qualities to cotton for specific uses, states Dr. G. E. Hilbert, chief of the Bureau.

The partial acetylation process, developed at the Bureau, is now in limited commercial use. It is the best method so far discovered for making cotton virtually rotproof and mildewproof.

Weather resistance for awnings, tents, shade cloth and seedbed covers was increased by a resin-pigment treatment. Samples of cotton duck treated with urea-formaldehyde resin in combination with lead chromate showed less than five percent loss of strength after a year's exposure to weather, compared to a loss of about 50% by untreated fabrics, the Bureau found.

Science News Letter, January 22, 1949

RADIO

Frequency Bands Crowded

➤ SQUEEZING new stations into already congested radio frequency bands to accommodate rapidly developing services has caused many headaches in the Federal Communications Commission during the past year, its annual report just issued seems to indicate. The report covers the fiscal year ended June 30, 1948.

Until methods and equipment are available to use higher portions of the spectrum, present frequencies must be employed more effectively, it says. During the year the Commission, in cooperation with industry, was engaged in reviewing and revamping existing radio service, and making studies looking forward to additional adjustments.

The general public is familiar with broadcasting because it enters the home. But it has little acquaintance with more than 50 other classes of radio stations, equally important in providing more than a hundred nonbroadcast services.

These nonbroadcast stations include safety and special radio services, devoted largely to safeguarding life and property on the land, sea or in the air. They include utilization of radio for industrial and business purposes, mobile stations for use in highway and other traffic, and radio stations in the aviation field which provide all sorts of services to aid air navigation.

Broadcast authorizations increased 400 over the previous year, bringing the total number of stations to nearly 4,000. Of this figure, 3,163 are major broadcast outlets. Of these, 2,034 are the long-used amplitude modulation (AM) type, 1,020 are the newer frequency modulation (FM) kind, and 109 are for television.

Certain trends in radio broadcasting are indicated by the type for which operation licenses were sought. During the first half of 1948, there was a sudden surge in television applications, and a leveling off of FM requests.

Noncommercial education broadcast stations increased from 38 to 46, and television experimental stations jumped from 81 to 124. The broadcast year was marked by authorization of facsimile, which was scheduled for commercial operation over FM stations.

Science News Letter, January 22, 1949

CHEMISTRY

University Grants to Aid Research in Chemistry

➤ A $100,000-program to aid in "stockpiling basic knowledge" of chemistry was announced by the Du Pont Company in Wilmington, Del.

Grants-in-aid of $10,000 to 10 universities are being made in the new program for the academic year 1949-50. Non-commercial research projects which will be selected by the universities will be aided by the funds.

Institutions receiving the grants are: California Institute of Technology; Cornell University; Harvard University; Massachusetts Institute of Technology; Ohio State University; Princeton University; Yale University; and the Universities of Illinois, Minnesota and Wisconsin.

Science News Letter, January 22, 1949

ENGINEERING

Fluorescent Lamps Light Brooklyn-Battery Tunnel

➤ THE Brooklyn-Battery tunnel, now being constructed to connect Brooklyn with New York proper with a highway under the harbor, will be lighted by four two-mile-long continuous ribbons of fluorescent light, it was revealed by General Electric which will install the system.

The tunnel is being constructed with two tubes, each with two traffic lanes. Each tube will be lighted by twin rows of white fluorescent lamps. A total of 5,776 individual lamps, each six feet long, will be employed. They will be housed in clear pyrex glass tubes near the tops of the sidewalls.

A unique feature of the lighting system is an automatic system that will turn on a higher intensity of light in the portal sections of the tunnel during bright daylight hours. This will promote safety for motorists driving from bright sunlight into the tubes at normal traffic speeds, by allowing the drivers' eyes to become gradually accustomed to the lower light level inside.

Science News Letter, January 22, 1949

AGRICULTURE

Foods of Tomorrow Tasty

New vegetables, fruits, poultry, cheese, ice cream and bread, developed by the U. S. Department of Agriculture will result in better, more savory food.

By MARTHA G. MORROW

➤ ON OUR menu were foods of tomorrow, choice dishes you will be eating a few years hence. The invitation to a U. S. Department of Agriculture luncheon could have read:

"Uncle Sam's scientists hopefully invite you to taste-test foods of your future—new vegetables, fruits, poultry, cheese, ice cream and bread developed in government laboratories, greenhouses and fields."

Gastronomically you may look forward with assurance. Farm experts, arising from the table, agreed the test meal was good to eat and good for you.

Every item on the menu was developed in the Department's research laboratories, green houses and fields. Only one of the dishes offered—the turkey— is now generally available on the retail market. One or two of the others have been released for the trade, so within a few years they may be available in your neighborhood. The majority, however, must undergo further tests before they go into large-scale production.

Few seed of the lima beans, served with the turkey, are available as yet. This variety, the Peerless, was bred to meet the need for a medium-size bean of good yield, yet well adapted to canning and freezing.

Nor are the large purple grapes which the guests enjoyed to be found in your market. Also bred by plant scientists of the Department, this variety is so new it has not yet been named.

The excellent baking quality of a new wheat variety called Comanche was shown by the bread offered the guests.

The green peas, also served with the turkey, result from research at the Western Regional Research Laboratory of the Bureau of Agricultural and Industrial Chemistry at Albany, Calif. Preserved by a new process in which the peas are practically dried and then quick-frozen (called "dehydrofreezing"), they have a fine flavor and take comparatively little space for storage and shipping.

The same laboratory was responsible for the salad, jellied fruit canned and shipped by air across the continent. The jelling agent used is low-methoxyl pectin, obtained from citrus and apple wastes by a process developed at the laboratory.

Assorted cheeses and a cheese spread from the Bureau of Dairy Industry supplemented the salad. They were made by a method, developed by the Bureau, that greatly simplifies the whole factory operation and enables the average cheese maker to produce a uniform and high quality product regularly.

The Bureau also contributed a new beverage milk, and ice cream made from sweet-cream buttermilk.

The menu sounded familiar, for we have enjoyed turkey, peas, grapes, cheese and ice cream before. But there was a difference in the food, an improvement of each item that promises better eating in the future.

Science News Letter, January 22, 1949

ENGINEERING

Model of Dam Planned for India Constructed in U. S.

➤ A REPRODUCTION in miniature of a section of one of India's largest rivers has been constructed on Hennepin island in the Mississippi near Minneapolis to help engineers work out the best method of control of the river during the construction of what will be one of the world's largest dams.

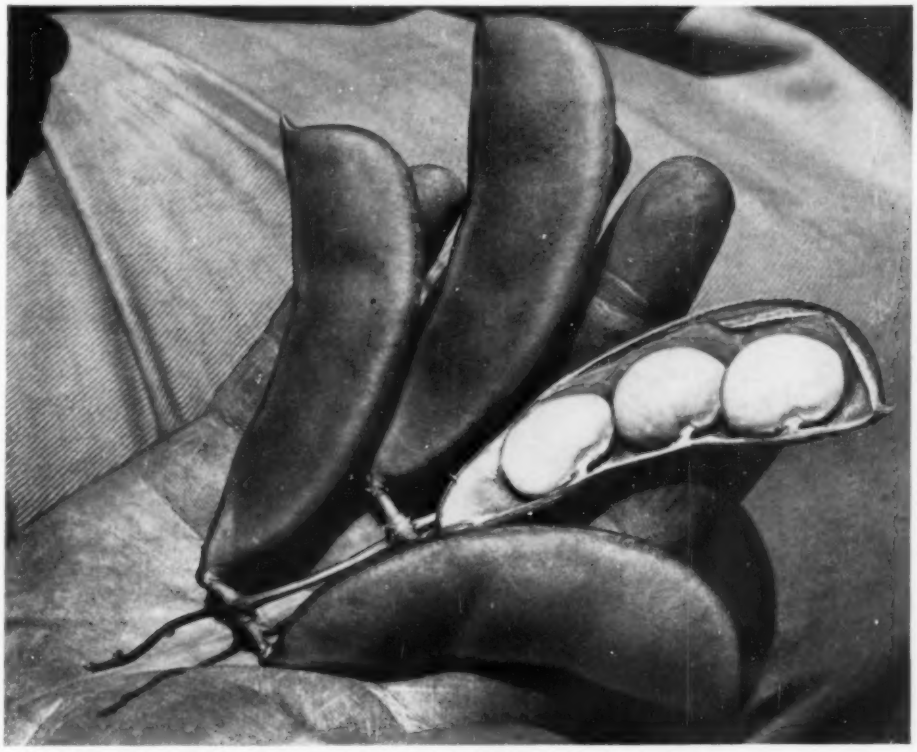
This working model was made by the University of Minnesota's St. Anthony Falls Hydraulic Laboratory by Dr. L. G. Straub, its director, and his assistants. The Indian river is the Godavari. The dam is to be built in the Province of Madras, southeastern India. It will be of concrete construction, 428 feet high, one and one-half miles long, and will impound a reservoir 100 miles in length.

This so-called Ramapadasagar project is primarily for irrigation, and will supply water for some 2,000,000 acres of farm land in the province. However, it will be also a huge power development and supply electric energy for many purposes.

During 1947, Dr. Straub spent much time in India as a consultant for the Indian government to make recommendations and to obtain the necessary field data for the experimental studies. This river presents many unusual problems, discharging at times as much water as the lower Mississippi at its highest stages.

This tremendous flow is due, according to Dr. Straub, to the extremely high rainfall in southern India. In some localities this reaches 500 inches in one season as compared with an average of about 25 inches annually in the Minneapolis area.

Science News Letter, January 22, 1949



LIMA BEANS IN YOUR FUTURE—Fat, uniform and thick-skinned, with a rich green color are the newly-developed Peerless variety of lima beans.

GERONTOLOGY

Being Male Means More Diseases and Shorter Life

➤ BEING a male carries with it the penalty of greater vulnerability to some diseases and a shorter lifespan, Dr. James B. Hamilton of Long Island College of Medicine reported to the meeting of the Gerontological Society in New York.

For the average American man, this means a five-years shorter lifespan than the average American woman has, he said, citing mortality statistics.

But the sex difference in ability to live holds true also, he finds for some 70 other species, from worms, crabs and insects to birds, fish, snakes and mammals.

"This," he said, "warns against the naive assumption that the sex-differing temperaments, habits or occupations of men and women account for a shorter lifespan of males than females or for the tendency of a particular pathological (disease) condition to select one sex."

The fat glands in a woman's skin grow less active with increasing age, but the reverse is true for men, Dr. Esben Kirk of Washington University School of Medicine, St. Louis, reported. His findings were made on measurements of the oily secretion of the skin of the foreheads of some 200 persons over the age of 40.

Aging has no effect on the amount of blood in the body, Drs. Jerome E. Cohen and Nathan W. Shock of the U. S. National Institutes of Health and Baltimore City Hospitals found.

Old age, however, brings a considerable degree of fatty degeneration of the parotid glands, in rats at least, Dr. Warren Andrew of Washington University School of Medicine reported. The parotid glands are best known to the layman when they become involved in mumps.

Science News Letter, January 22, 1949

INVENTION

Roadable Plane Has Detachable Auto Front End

➤ THE OLD problem of the roadable airplane is tackled in a new way by a pair of inventors, Robert E. Fulton, Jr., of Washington, and Octavio J. Alvarez of New York, who have received U. S. patent 2,457,884 on their design.

Essentially, their craft consists of a separable cabin, power-plant and controls, mounted on four wheels so that it looks much like the conventional small car, which can be backed up and attached to a fuselage and pair of high-mounted wings. The latter can be left in the hangar or on the tarmac at the landing field while the operator drives on into town in the roadable front half of the machine.

The same steering wheel serves both in the air and on the ground; it is so geared that its motion can be limited to a part of a full turn for aileron control or released to make several full turns for steering on the ground. It is also free for push-pull elevator control in the air, but locked against such motion when used for ground steering.

When the craft is being prepared for travel by road, the propeller blades are removed from its nose, but the propeller boss remains in place as an ornament on the front end of the motor-car section.

Science News Letter, January 22, 1949

ANTHROPOLOGY

Life in Wat Bang Chan Studied by Scientist

➤ LIFE in Wat Bang Chan is getting a scientific investigation by an American scientist.

Wat Bang Chan (pop. 1,200) is a village north of Siam's capital city, Bangkok. The life of its inhabitants is being studied by a Cornell University anthropologist, Prof. Lauriston Sharp, who has been in Siam since last July.

The impact of western civilization, war and Siamese government programs on the people of Wat Bang Chan is getting particular attention, Prof. Sharp's first progress report said.

Part of a university program in cultural anthropology, the work in Siam is made possible by grants from the Carnegie Corporation of New York and also is supported by the Rockefeller Foundation, the Viking Fund and the Social Sciences Research Council.

Science News Letter, January 22, 1949

GENERAL SCIENCE

Columbus Was Mistaken For Two Other Guys

➤ THE Hungarian historian who said that Columbus was a Mediterranean pirate fleeing from an assassin when he discovered America was thinking of two other guys.

That is the suggestion of a leading American authority on Columbus, Prof. Samuel Eliot Morison of Harvard University. The two other guys were a French admiral and a Greek pirate. Their being confused with the discoverer of America is an old story, Prof. Morison explains. The Greek pirate, Bissat, and the French admiral, Cazenove, were both variously known as Cazenove, Colon and Columbo.

Any claims that either or both of these characters had anything to do with the discovery of America are termed "all nonsense," by Prof. Morison.

The Harvard historian was awarded a Pulitzer Prize five years ago for his comprehensive biography of Columbus, "Admiral of the Ocean Sea."

Of his subject, he notes, "Columbus, like Lincoln, seems to get particular attention from nuts."

Science News Letter, January 22, 1949

IN SCIEN

PSYCHOLOGY

"Life with Father" Headed for Extinction

➤ THE traditional type of family in which Dad lays down the law, and Mother does not interfere with his discipline is probably on the way to extinction in America.

This is the tentative prediction of Dr. Hazel L. Ingersoll, of the Department of Child Development and Family Relationships of Cornell University. Her conclusion is based on the study of how 37 families are ruled.

Whether Dad or Mom "wears the pants" in your own family depends at least in part on the sort of families they grew up in, Dr. Ingersoll found.

The man who grows up as a spoiled mama's boy tends to pick for a wife a girl who can take over management of the household, thus reproducing the pattern of his own boyhood home.

And the man, or the woman, who lived a life with father as the dominating figure is inclined to reproduce this pattern in his own marriage.

But if one parent comes from a home in which father was the undisputed boss and the other has had a dominant mother, then there is likely to be conflict between them over bringing up the children, with a resulting divided responsibility and authority. This "equalitarian" pattern of family government is also likely to be handed on to the children when they grow up to have families of their own.

The greatest number of families in the group studied by Dr. Ingersoll were of the type in which both father and mother share in the family responsibilty or in which either father or mother led the group but did not dictate.

Details of the study are reported in GENETIC PSYCHOLOGY MONOGRAPHS.

Science News Letter, January 22, 1949

VETERINARY MEDICINE

Elephants Suspected of Spreading Tuberculosis

➤ A POSSIBLE new tuberculosis menace: elephants.

The U. S. Department of Agriculture's Bureau of Animal Industry cited the case of an elephant that died of pulmonary tuberculosis at the National Zoological Park in Washington. The Bureau's annual report said the case demonstrated "the possibility that elephants may spread tuberculosis among man and animals."

Studies have indicated that the elephant died of human-type TB.

Science News Letter, January 22, 1949

E FIELDS

VETERINARY MEDICINE

England's Dogs Feeling Pinch of Austerity Diet

➤ ENGLAND'S austerity diet is not only putting its pinch on the people; it is hard on the dogs as well, reports A. Stewart Rich, founder of the London Animal Hospital. As a result of their impoverished diet, English dogs now require nearly double the veterinary care they received before the war.

Effects of dietary deficiency are especially noted in dog breeding, Mr. Rich reports. Puppies have a hard time getting born, due to their mother's poor condition; and after they are born she is often unable to produce milk enough to nurse them.

Bone formation is poor, and rate of growth is retarded as much as 25% during the first 10 weeks of puppy-hood. Fifty percent of the puppies treated at the hospital have been under weight, as compared with only 10% or 15% in prewar days.

Among ailments now prominent among dogs are rickets, slow convalescence after illness, slow healing of broken bones and skin troubles. The latter group of diseases attack well over a third of all dogs brought to the hospital.

A new disease has also appeared. It is known by the technical name of beta-hemolytic-streptococcus, and it has caused greater mortality in English kennels than any other disease. Death rate exceeds that from distemper.

Dog food is sold on a quota basis, and the problem of getting enough is a difficult one for dog owners. When meal or dog biscuit is in short supply, it is mixed with potatoes or some other unsatisfactory substitute.

Science News Letter, January 22, 1949

GERONTOLOGY

West May Need Chinese Attitude Toward Old Age

➤ WESTERN NATIONS, with their increasing numbers of old and retired people, may need to adopt some of the Chinese attitude toward old age, Dr. Albert R. Chandler of Ohio State University, advised at the meeting of the Gerontological Society in New York.

"Chinese sages and poets," he said, "have taught that happiness is to be found in tranquillity, moderation, family relationships and aesthetic appreciation of the little things in life. Therefore a healthy old age is considered the happiest phase of life."

The shock of discovering suddenly that one is growing old is a condition doctors need to be ready to treat as they are prepared to treat other kinds of shock, Dr. Martin Gumpert of New York suggested.

Sudden heart failures, mental breakdowns, emotional unrest, loss of working capacity, unexpected social discrimination or rejection are conditions that can bring on the shock of aging, he pointed out.

"Problem" old people, in the opinion of their juniors in college, are those who have a complaining or difficult disposition, lack contacts outside the home, are not occupied in any way and in some cases are in a community other than that in which they lived before retirement.

Common traits among the old people considered "successful" are hobbies, recreational interests, acquaintances in the neighborhood and community, a cheerful disposition and efforts to be helpful.

The college students' opinions were collected and reported by Elizabeth M. Simcoe and S. L. Pressey of Ohio State University.

The critical age at which aging affects airline pilots' fitness to fly is between 45 and 55 years, Dr. Ross A. McFarland of the Harvard School of Public Health reported.

Hearing tested by the audiogram and keenness of vision and depth perception were studied in hundreds of pilots ranging from 20 to 55 years.

The pilot's fitness to fly, these studies showed, depends on his psychological and physiological status rather than on age in years. It is influenced by the combined effects of aging and the requirements of airline piloting.

Science News Letter, January 22, 1949

NUCLEAR PHYSICS

Chemist Makes Guess at Atomic Bomb Charge Size

➤ HERE is one chemist's guess at one of the world's top secrets:

The explosive charge in an atomic bomb is about the size of an indoor baseball but weighs 20 to 30 pounds.

This estimate was made by Prof. J. A. Campbell of Oberlin College, Oberlin, Ohio.

"In spite of all the supposed secrecy about the bomb," Prof. Campbell told a meeting of the Erie section of the American Chemical Society at Allegheny College, Meadville, Pa., "it is easy to show that the explosive charge weighs in the neighborhood of 20 to 30 pounds and occupies a sphere of three to four inches in diameter—about the size of an indoor baseball."

He declared that 10,000 atomic bombs can be made from known deposits of fissionable elements, adding that new deposits are being discovered.

"Any country with a considerable land area is bound to have available to it sufficient stocks of fissionable material at least for bomb production," Prof. Campbell asserted.

Science News Letter, January 22, 1949

NUCLEAR PHYSICS

Uniformity Featured By New Atom Smasher

See Front Cover

➤ A TYPE of atom smasher that gives high speed particles at uniform energy is being built by the General Electric Company for the Brookhaven National Laboratory at Upton, Long Island, N. Y.

A 3,500,000-electron-volt electrostatic accelerator, the new machine is of a type which has less power than the more famous cyclotrons and certain other varieties of atom smashers. But, General Electric scientists explain, the electrostatic accelerator gives uniform velocities to individual particles which are valuable for making accurate measurements in nuclear research.

On the cover of this week's SCIENCE NEWS LETTER is shown one of several electronuclear machines under construction for Brookhaven National Laboratory. It will be used for a variety of fundamental studies of the atomic nucleus.

According to N. Rohats, engineer who directs work on the machine, electrostatic charges will be carried from one end of the machine to an aluminum sphere at the other end by two moving belts. Not yet installed, these belts will travel between the two long tubes shown in the foreground.

Science News Letter, January 22, 1949

INVENTION

Propose Radar-Like Uses Of Solar Microwaves

➤ RADAR-LIKE navigation and orientation without the use of artificially generated radio waves is the truly radical proposal made by Dr. George C. Southworth, research engineer of the Bell Telephone laboratories in New York. U. S. patent 2,458,654 has been issued on this basic idea in various embodiments.

Very short radio waves, of the order of one centimeter in length, are given off by the sun and other stars, Dr. Southworth points out. By using suitable receivers, these radiations can be used to make accurate determinations of the sun's position even though the sky be overcast. Obviously this can be of great value in navigation.

Similarly, there is a marked difference in intensity of very short-wave radiations received by reflection from the sky and from the ground. This can be used in determining the position of an invisible horizon, and even in getting silhouettes of tall buildings, chimneys and other objects projecting above it. Use of suitable scanners, Dr. Southworth states, can even produce recognizable pictures of terrain made invisible by ground fog or smoke.

Science News Letter, January 22, 1949

ASTRONOMY

Saturn Shines All Night

This is the only planet seen in February evenings. Sirius, the dog-star in the constellation of Canis Major, is the most brilliant star to be seen.

By JAMES STOKLEY

➤ TO THE normally fine display of bright stars in the February evening sky we have added in this month the planet Saturn, famous for its rings, which require a telescope to see. On the 21st Saturn is in opposition with the sun, which means that it is directly opposite that body. Thus it rises in the east as the sun sets in the west, and is visible throughout the night.

The accompanying maps show how the sky appears about 10:00 o'clock on Feb. 1, and an hour earlier at the middle of the month. At such times Saturn appears to the east, in the constellation of Leo, the lion, which is about halfway from the horizon to the zenith. Saturn is just below the hook-shaped group of stars in this figure called the sickle, and of which the star Regulus marks the end of the handle. Regulus is of magnitude 1.3 on the astronomer's scale. It is considerably fainter than Saturn which is now of magnitude 0.4, making it about 2.3 times as bright.

Most brilliant star to be seen, however, is shown directly south. This is Sirius, the dog-star, in the constellation of Canis Major, the greater dog. Its magnitude is minus 1.58, which makes it about 6.3 times the brightness of Saturn.

Orion, the Warrior

Above and to the right of Sirius we see Orion, the warrior, one of the finest of constellations. Above the three stars in a row representing his belt is the bright star Betelgeuse, while below is Rigel, with about the same magnitude as that of Saturn. Above Sirius is Canis Minor, the lesser dog, with Procyon as the brightest star. Still higher, indeed nearly overhead, are Gemini, the twins, with first magnitude Pollux. Almost directly overhead, as shown on the maps, is Capella, in Auriga, the charioteer.

High in the southwest, to the right of Orion, Taurus, the bull, may be seen. In this group is a V-shaped group of stars, called the Hyades, which mark the animal's face, and the star in the upper part of the left-hand arm of the V is the brilliant and ruddy Aldebaran, which marks his eye. Farther to the right, in the bull's shoulder, is another famous small group of stars known as the Pleiades, but these contain no bright object.

Even if you wait up all night in February, you may not easily be able to see more than two other planets. One is Jupiter, now in the constellation of Sagittarius, the archer, which comes up in the southeast nearly two hours ahead of the sun. On Feb. 28 Mercury will be farthest west of the sun, but it will be so low in the southeast that it will be hard to find. Venus is in the same part of the sky, in the constellation first of Sagittarius and then of Capricornus, and is so brilliant, even exceeding Sirius, that it should be located low in the east at dawn. Mars is so close to the sun that it can hardly be seen at all in February.

Great Nebula

Extending southward from the star called Alnilam, which is the one in Orion's belt nearest to Sirius, are some fainter stars that form the warrior's sword. One of these stars, particularly if you look at it through binoculars, seems to have a rather hazy appearance. Through a big observatory telescope it is seen to be a luminous cloud of light, known as the great nebula in Orion.

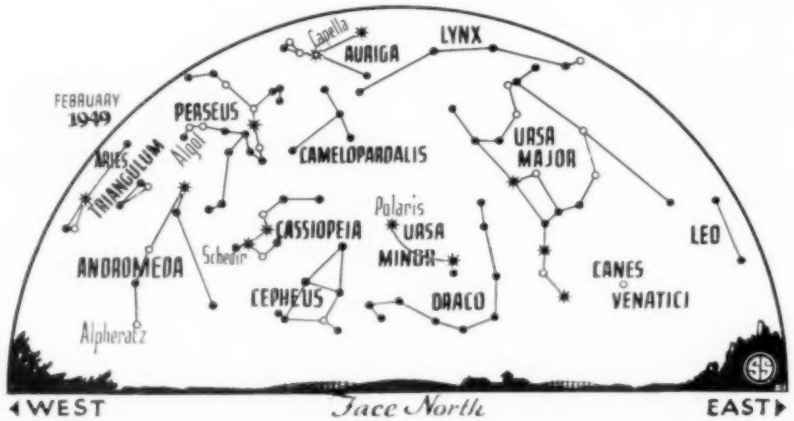
It is rather curious that Galileo, who in 1610 was the first astronomer to study the heavens through a telescope, failed to observe this nebula. He did make a careful examination of Orion, and left us in one of his works a star chart of the constellation showing many stars too faint to be seen with the naked eye which he saw for the first time. This chart, however, shows no indication of the nebula. Perhaps the images shown by his primitive instrument were all so fuzzy that he did not notice anything very different about the stars at the heart of the nebula, so the actual discovery was left for one of his admirers, Peiresc, of Provence, who discovered it in December, 1610.

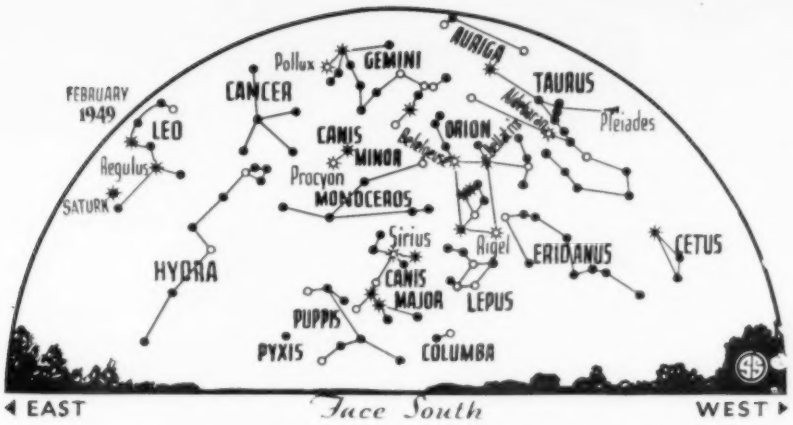
Later, many other nebulae were discovered and in 1781 the French astronomer Messier made a catalog of 103 such objects. He was interested not in the nebulae themselves, but in comets, and often had picked up a supposed new one to find that it was just a nebula. Therefore he made a catalog of the latter so that he could easily check them. The one in Orion is number 42 in his list, so now that object is often referred to as M.42. Other nebulae, too, are frequently designated by such a "Messier number," even though to that gentleman they were probably merely a nuisance that interfered with his real interest.

During the 18th and 19th centuries, the English astronomers, father and son, Sir William Herschel and Sir John Herschel, made a much more complete catalog. However, at that time their true nature was unknown. Some of Messier's nebulae were shown by Herschel's telescopes to be clusters of stars, and it seemed reasonable to suppose that the others were similarly constituted, but needed superior telescopes to resolve them.

100-Inch Telescope

This turned out to be true for some, particularly those which have a spiral structure, but it took the 100-inch telescope at the Mt. Wilson Observatory, largest in the world until the recent completion of the 200-inch at Mt. Palomar, to reveal their constituent stars. An explanation of the nature of some of the others was obtained in the 60's with the newly invented spectroscope, which analyzes the light from the celestial bodies. A star such as the sun, it was found, gives a spectrum consisting of a continuous band of color, crossed by dark lines. In 1864, Sir William Huggins examined spectroscopically a bright little nebula in the northern sky, and found that its spectrum was just one bright green line. Since then other lines have been found, but they are all bright, against a dark background, and the spectrum of the Orion nebula has a similar appearance. A bright-line spectrum is characteristic of a glowing gas, so the nature of these nebulae became immediately ap-





☼ ✱ ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

parent and we now call them gaseous nebulae.

This did not, however, explain the source of energy which keeps such a nebula glowing, but now it is believed that the process is the same as that which takes place in a fluorescent light. In one of these lamps an electrical discharge passing through mercury vapor causes it to give off some blue light, and a great deal of ultraviolet radiation, which is similar to light, but consists of waves too short to affect the eye. The tube is lined with a fluorescent material called a phosphor. When ultraviolet rays hit atoms in the phosphor some of the electrons are knocked out of their usual orbit in which they revolve about the atomic nucleus. Soon, however, they fall back into place and when they do they give off visible light. Most of the gaseous nebulae have very hot stars at their center which are giving off much ultraviolet, and these rays similarly knock electrons out of the atoms of the nebulae. Falling back, they give off light, some of which eventually reaches us.

Time Table for February

Feb.	EST	
1	9:00 p. m.	Moon farthest, distance 252,000 miles
2	1:00 p. m.	Mercury between earth and sun
6	3:05 a. m.	Moon in first quarter
10	2:00 a. m.	Mercury passes Venus
13	4:08 a. m.	Full moon
	5:01 p. m.	Moon passes Saturn
14	5:00 a. m.	Moon nearest, distance 222,800 miles
19	7:43 p. m.	Moon in last quarter
21	1:00 p. m.	Sun and Saturn in opposite parts of sky
23	5:54 p. m.	Moon passes Jupiter
25	2:21 a. m.	Moon passes Mercury
26	10:02 a. m.	Moon passes Venus
27	3:55 p. m.	New moon
	9:42 p. m.	Moon passes Mars
	Midnight	Mercury fathest west of sun

Subtract one hour for CT, two hours for MT, and three for PT.

Science News Letter, January 22, 1949

MEDICINE

New Uses of Blood Ahead

➤ ON Jan. 12 the National Blood Program of the American Red Cross went into its second year of operation.

As the benefits of the first year of this activity are recounted, prospects of further disease-fighting uses of blood appear in medical research reports. For the future there is the possibility of using fractions of blood against scarlet fever, mumps, and jaundice as some blood fractions are now being used to check measles.

Most important use for blood remains the saving of lives of persons who have lost large amounts through injury or disease. But during the war, while the Red Cross was collecting blood for this use by the armed forces, a method of dividing blood into various fractions, each of them potentially useful, was discovered. Aim of the National Blood Program now is to collect, process and distribute enough blood and blood fractions to supply all the blood needs of the nation in peace as well as in war or other national disaster.

Blood for this program is being collected, processed and distributed through a series of regional centers. To date 18 of these centers have been opened, in addition to a state-wide mobile unit service in Massachusetts. Some centers have only gone into operation within the past month. Longest in operation is the one in Rochester, N. Y., which opened just a year ago, on Jan. 12, 1948.

By the end of the present fiscal year, June 30, 1949, more than 30 centers are expected to be in operation. Those now in operation for one or more months, in addition to Rochester, are: Wichita, Kans., Tucson, Ariz., Stockton, San Jose and Los Angeles, Calif., Atlanta, Ga., Washington, D. C., Omaha, Nebr., Springfield and St. Louis, Mo., Charlotte, N. C., Detroit and Lansing, Mich., Yakima, Wash., Great Falls, Mont., Columbus, Ohio, and St. Paul, Minn. Arrangements have already been completed for opening of centers at Portland, Ore., Boise, Ida., Philadelphia, Pa., Nashville, Tenn., and Louisville, Ky.

More than 110,000 pints of blood have been collected and the program has served more than 700 hospitals and 33 clinics. The Red Cross makes no charge for the blood or its derivatives available through the program. Physicians and hospitals, however, may charge for administration of the blood and for any other services undertaken to safeguard the patient.

"The program has been increasingly successful in meeting calls for blood," Basil O'Connor, president of the American Red Cross, said. "This has been due not only to the generosity of the American people but to the cooperation of physicians, hospitals, and health departments. But the program has still a long way to go before it reaches truly national proportions."

Science News Letter, January 22, 1949

CHEMISTRY

Dr. Lewis Honored by Institute of Chemists

➤ DR. WARREN K. LEWIS, emeritus professor of chemical engineering at the Massachusetts Institute of Technology, will be awarded the 1949 gold medal of the American Institute of Chemists at the Institute's annual meeting in Chicago in May.

Dr. Lewis, who is noted for research in petroleum and leather chemistry, will be honored for his administrative ability, leadership and outstanding success as a teacher.

Science News Letter, January 22, 1949

CAR BUYERS BEWARE

Don't Get "Stuck"!

Do you know the 36 tricks used to defraud new and used car buyers? A fair price to pay? A fair trade-in? Fair financing and insurance? The costs of running a car? How to spot a "lemon"? A stolen car? These and many other questions are clearly answered in the 96 easy-to-read pages of:

"HOW TO BE AN EXPERT CAR BUYER" R. J. Schmunk, President of AAA—"Even a hasty reading of your valuable book should prevent most people from falling into the most obvious mistakes." It's authoritative, indispensable, and invaluable to anyone who will buy a car this year. Postpaid $1.10; COD $1.30; Airmail $1.50. Order now from your bookstore, Sears Catalog, or:

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MEDICINE

Disease Hints from Blood

➤ CLUES to treatment of heart disease and infantile paralysis may come from research on blood such as is now being carried on through the National Blood Program of the American Red Cross.

This possibility for the future was suggested by Dr. Ross T McIntire, war-time Surgeon General of the Navy and now administrator of the National Blood Program, when he appeared as guest of Watson Davis, director of Science Service, on Adventures in Science, radio program presented under the auspices of Science Service over the Columbia Broadcasting System.

The National Blood Program is designed to provide blood and blood derivatives for medical use throughout the nation. Whole blood and blood plasma, fibrin foam sponges for checking bleeding at operations, fibrin film substitutes for the brain's covering membranes, antihemophilic globulin, immune serum globulin for checking measles are already being processed and distributed through the program. All of these come from the blood being given by Americans to the score of regional centers already in operation.

But as more centers are opened and more blood flows into the reservoirs for saving life and health, some can be spared for research to find new uses for blood in treating disease.

"That research has just begun," Dr. McIntire said. "But we know that everything for health, growth, for maturing, is in or eventually gets into our blood. We already know scientists have identified some 60 proteins in plasma. Only a few are in medical use. It may well be that the future will unlock the secrets of blood that may furnish the clue to treatment of heart disease and infantile paralysis."

Science News Letter, January 22, 1949

PSYCHOLOGY

Clue to Personality

➤ A PSYCHOLOGIST who counted the number of lines spoken by each of the characters in Shakespeare's plays believes he may have found a clue to your personality—as well as the little-known personality of the immortal bard.

Harold Grier McCurdy of the University of North Carolina explains that he first assumed that fictional literature is a projection of the author's personality. Thus, you can study the personality of the author by studying his work.

He counted the lines spoken by Shakespearean characters in 36 plays. Excluded was "Henry VIII," which may have been finished by another author. Also excluded was the controversial suggestion that Sir Francis Bacon or someone else wrote all of the Shakespeare plays. In addition, he counted seven plays by the early Greek poet, Sophocles, and four novels by the English writer, Charlotte Bronte.

Dr. McCurdy said that his findings support the idea that the human personality—both yours and Shakespeare's—is an orderly arrangement of constituents with one ingredient dominating the others.

In Shakespeare's case, this organization of the personality was pointed up as he grew older, the psychologist explains.

Shakespeare, he found, gave a few more lines, proportionately, to his subsidiary characters than either Sophocles or the English novelist. The main character, who had the most lines, was given a "character weight" of 100, with other parts getting lower ratings. The novels were given a "page weight", because of the different structure of the novel.

Comparing 14 Shakespearean comedies with 14 tragedies, Dr. McCurdy found that the lesser roles rated more lines in the comedies.

Dividing the plays into three groups of 12 plays each, in order of their dates, it was discovered that the later plays gave more emphasis on the central character and the subsidiary parts had fewer lines.

The theory that personality development is a matter of organizing was advanced by the late Dr. William McDougall of Duke University. He compared the personality with an army in the field. Dr. McCurdy's study of this theory, by a mathematical approach to Shakespeare, has been published in the JOURNAL OF PERSONALITY (Sept).

Science News Letter, January 22, 1949

GENERAL SCIENCE

Time Judgment Important Traffic Study Reveals

➤ YOU MAKE a judgment of time—not distance—when you drive your car into an opening between vehicles in traffic.

This theory was announced by the Yale University Bureau of Highway Traffic, in a report issued as a part of a study to find how to design safer highways.

Movement of cars was studied with motion pictures made on the Henry Hudson Parkway near George Washington Bridge in New York and at Pulaski Circle in Hartford, Conn. The investigation was made by three former Yale students, F. Houston Wynn of the Territory of Hawaii Department of Public Works, Stewart M. Gourlay of the City of Detroit Department of Street Railways, and Richard I. Strickland, of the Port of New York Authority.

If you're an average motorist, the study indicated, you need a "distance" of six seconds before entering the passing or through lane after a stop sign. But you will weave into an adjacent lane with the car in motion in two and one-half seconds.

The report said that time studies of driving might be used to plan highways to accommodate most motorists.

Science News Letter, January 22, 1949

ORNITHOLOGY

Discover Birds that Kill with Cleanliness

➤ HERE'S one Junior can tell Mom about on Saturday nights. It's the story of birds that kill themselves with too much bathing.

Pacific fulmars, gull-like cousins of the famed albatross and the stormy petrels of the Atlantic, have a passion for bathing. They will bathe themselves for more than an hour at a stretch. Sometimes, a scientist reported, they take such a long bath that they get water-logged, sink and drown.

This sad end of some captive fulmars was observed by Henry Kritzler, a national research fellow at the Scripps Institution of Oceanography in La Jolla, Calif. He lured some Pacific fulmars into captivity to study them.

Unlike the stormy petrels of the Atlantic, they proved to be quite peaceful in captivity. But the fastidious fulmar's love for taking a bath can be his undoing.

Science News Letter, January 22, 1949

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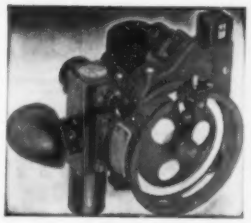

These Army Air Forces Bubble Sextants costs the Govt. about $125.00 each. A real bargain at our price at $12.50! Wooden carrying case included. Also auxiliary items. Wartime used. **BUT COMPLETELY REPAIRED COLLIMATED AND PUT IN GOOD WORKING ORDER.** If not satisfied that Sextant is exactly as represented, return within 10 days for refund. Full directions for use accompany each shipment.

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ENTOMOLOGY

NATURE RAMBLINGS

by Frank Thone

Insects in Winter

➤ WINTER is commonly thought of as a time of death for the lesser winged and creeping creatures—insects, spiders, centipedes and the like. We are used to the migration of birds and the hibernation of mammals; but insects we think of as either perishing with the first stiff frost or spinning themselves into sheltering cocoons and sleeping it out as pupae.

We are of course well used to seeing surviving flies and mosquitoes flitting about in our houses and occasional spiders and centipedes furtively on the crawl at odd times during the winter. However, we are prone to take credit to ourselves for involuntarily providing shelter for these undesired guests. Outside, assuredly, insects cannot live through the season's severity, we think.

It comes as a surprise to many of us, therefore, to see occasionally, during a January thaw, and more frequently as late winter merges into early spring, a considerable population of adult insects creeping or flitting about in the short release that the midday hours give them from the stiff thralldom winter normally imposes on them.

Almost everyone gets to see winter-wandering ladybird beetles and those odd-shaped but attractively-colored insects, the box-elder bugs. Unobservant indeed must be the person who fails to notice woolly-bear caterpillars hastening, humpity-hump, across sunny sidewalks and patches of bare earth.

Rarer is the treat afforded by the mourning-cloak butterfly, and you have to walk the winter woods for a chance to see it. There are other butterflies that over-winter in the adult state, but they are smaller and less conspicuously colored than the mourning-cloak, and hence less likely to be noticed. Even the mourning-cloak is not apt to catch your eye unless it is in flight or preparing to take off. Then the light-bordered dark upper surfaces of its wings are visible. When it is resting, whether in active state or chilled into immobility as it clings to a tree, these are folded up together and only the camouflaging, bark-colored under sides are presented.

Science News Letter, January 22, 1949

QUICK-READING TEMPERATURE-CONVERSION TABLES

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METEOROLOGY

Record-Breaking Cold

➤ SO YOU think it's cold, do you? Well, take it from the old-timers, it got lots colder when Grandpa was a boy!

That's not just garrulous old age bragging about its own departed frost-bitten toes; it's a matter of cold, scientific fact. The biggest cold wave that has hit this country in the 70 years of official records kept by the U. S. Weather Bureau was the one that came just a month less than 50 years ago, in February, 1899. That was the time the thermometer got down to two below zero at Tallahassee, in northern Florida.

The same cold wave established record lows that have not been matched since, in nine states: Ohio, 39 below; Virginia, 29 below; Kentucky, 30 below; Mississippi and Louisiana, tied at 16 below; Texas, 23 below; Florida (as already mentioned), 2 below; Nebraska, 47 below; Montana, 63 below.

There was another February cold wave in 1905, that set a few low records: Alabama, 18 below; Arkansas, 20 below; Kansas and Missouri both 40 below; Oklahoma, 27 below.

The coldest cold wave that ever did hit the country invaded the northern Rocky Mountain region in 1933. Like the 1899 and 1905 frostbiters, it came in February. However, it did not spread far. It hung up the all-time low-temperature record for the entire United States when it curdled the mercury in the bulb of a thermometer at a ranger station in Yellowstone National Park (Wyoming) at 66 below zero Fahrenheit. It also set all-time low records of 54 below in Oregon and Colorado, tied a previous low of minus 50 in Utah, and then slowly warmed up.

Here are the record low temperatures (without dates) for states not already mentioned. All figures, of course, are in degrees below zero Fahrenheit: Maine 48, New Hampshire 46, Vermont 50, Massachusetts 30, Rhode Island 23, Connecticut 32, New York 52, Pennsylvania 42, New Jersey 34, Delaware 17, Maryland 40, Virginia 29, West Virginia 37, North Carolina 21, South Carolina 13, Georgia 17, Alabama 18, Tennessee 32, Ohio 39, Indiana 33, Illinois 35, Michigan 51, Wisconsin 54, Iowa 47, Minnesota 59, North Dakota 60, South Dakota 58, Nebraska 47, Arkansas 29, New Mexico 46, Arizona 33, Nevada 50, Washington 42, Oregon 54, and California 45.

Obviously, many of these low temperatures were reached only at high altitudes; states without mountains, like Florida, cannot hope to compete with states that have them, like California, when it comes to frostbite honors. But then, maybe they wouldn't want to.

Science News Letter, January 22, 1949

WILDLIFE

Loose Dogs Kill Deer; Owners Given Warning

➤ EXTERMINATION of timber-wolves in most of the states of the Union has meant little respite for deer; dogs on the loose have taken their places. In New York State alone, the Wildlife Management Institute declares, free-hunting dogs killed a thousand deer during a 10-day period.

Owners of dogs are cautioned to keep their dogs chained up, for the good of the dogs as well as for saving of the deer. Game management authorities in most states are empowered to kill dogs found worrying deer—and with the bloody example of New York before them are very likely to do it.

Science News Letter, January 22, 1949

Books of the Week

TO SERVE YOU: To get books, send us a check or money order to cover retail price. Address Book Dept., SCIENCE NEWS LETTER, 1719 N St., N. W. Washington 6, D. C. Ask for free publications direct from issuing organizations.

BASIC PRINCIPLES OF PSYCHOANALYSIS—A. A. Brill—*Doubleday*, rev. ed., 298 p., $3.45. A well-known work almost completely rewritten by Dr. Brill before his death in 1948.

BIRD DOGS IN SPORT AND CONSERVATION—Ralph E. Yeatter—*Illinois Natural History Survey Division*, 64 p., illus., paper, free upon request direct to publisher. Telling how to select and train your dog.

CONSERVATION IN THE UNITED STATES—A. F. Gustafson, C. H. Guise, W. J. Hamilton, Jr., and H. Ries—*Comstock*, 534 p., illus., $5.00. Important information on a vital subject.

FOUNDATIONS OF MODERN PHYSICS—Thomas B. Brown—*Wiley*, 2d ed., 391 p., illus., $5.00. Includes new material on electronics, microwaves and nuclear physics. For the student who has already studied elementary college physics.

KANSAS ROCKS AND MINERALS—Laura Lu Tolsted and Ada Swineford—*State Geological Survey of Kansas*, 54 p., illus., paper, 5 cents. A beautifully illustrated booklet in nontechnical language especially for the amateur collector.

LAWN LABORATORIES—E. Laurence Palmer—*N. Y. State College of Agriculture*, 32 p., illus., paper, 20 cents. A Cornell Rural School Leaflet giving interesting information not only about the grasses of your lawn but the fauna found there, too.

PROBLEM BOOK IN THE THEORY OF FUNCTIONS: VOLUME I, PROBLEMS IN THE ELEMENTARY THEORY OF FUNCTIONS—Konrad Knopp—*Dover*, 1st American ed., 126 p., $1.85. Translated by Lipman Bers.

READINGS IN THE CLINICAL METHOD IN PSYCHOLOGY—Robert I. Watson, Ed.—*Harper*, 740 p., $4.50. Contains 50 papers by specialists in various fields of clinical psychology. For the shelf of the student of psychology or the practicing clinical psychologist.

SCIENTISTS AND AMATEURS: A History of the Royal Society—Dorothy Stimson—*Schuman*, 270 p., illus., $4.00. The Royal Society, like the Philosophical Society in this country had its way paved when learned men got together to talk over their problems and enthusiasms. The Royal Society was chartered in 1662.

SONS OF SCIENCE: The Story of the Smithsonian Institution and Its Leaders—Paul H. Oehser—*Schuman*, 220 p., illus., $4.00. The story of the Smithsonian Institution leaders is, to a large extent, the history of scientific development in this country from the days of Joseph Henry who was the first secretary.

THE STRATIGRAPHY AND STRUCTURAL DEVELOPMENT OF THE SALINA BASIN OF KANSAS—Wallace Lee, Constance Leatherock and Theodore Botinelly—*University of Kansas*, 155 p., package of plates, paper, 25 cents. Report of a cooperative investigation by the State Geological Survey of Kansas and the U. S. Geological Survey.

WHAT'S HAPPENING IN INDUSTRIAL HEALTH? —John F. McMahon—*Mellon Institute*, 4 p., paper, free on request to publisher at University of Pittsburgh, Pittsburgh 13, Pa.

WOMEN—AND THEIR MONEY—Maxwell S. Stewart—*Public Affairs Committee*, 32 p., illus., paper, 20 cents. Advice and information about living expenses and investments.

Science News Letter, January 22, 1949

GEOLOGY

Hawaii's Volcano Harmless

➤ RELAX, and don't waste any sympathy on the Hawaiians who have just had the world's largest mountain begin pouring out hot lava over their largest island. Unlike Vesuvius and other famous volcanoes, the eruption of a Hawaiian volcano is not a disaster but a rather profitable and generally harmless show.

Tourist trade always booms following a nice eruption by Mauna Loa or one of the other Hawaiian volcanoes, and this is no small industry in our statehood-ambitious islands. Scientists who risk death getting closeups of some volcanic eruptions have a safe field day charting lava flows in Hawaii.

No one has ever been killed by the eruption of Mauna Loa. This, despite the fact that "long mountain" is the biggest volcano in the world.

Not so tall as its twin volcano, Mauna Kea, Mauna Loa is actually the largest mountain in the world, in total volume.

Hawaiian eruptions are spectacular and violent, but they are not so much so as the more dangerous skyward fumings of most other active craters. Molten lava pours out at a great rate—more lava flows from Mauna Loa than any other volcano.

But there are none of the dangerous showers of ash, stones and hot mud which make most erupting volcanoes a pretty hazardous spot for sightseeing.

The present eruption seems to have come as a surprise. So closely studied are the Hawaiian craters that volcanologists usually can predict an eruption. Dr. T. A. Jaggar of the University of Hawaii has even worked out a cycle for forecasting Mauna Loa's frequent outbursts.

But officials of the U. S. National Park Service in Washington said this eruption came as a surprise. The Hawaiian volcanoes have been a national park since 1916.

To predict eruptions, scientists use two different methods. One is a tilt measurement, made with a plumb bob suspended over a calibrated scale. When a sharp tilt is noted toward the center of the crater, it means that the volcano is falling away a bit. But when a sharp tilt is noted outward, pressure is rising in the crater and an eruption may be forthcoming.

Seismographs which register earthquakes also tip off most eruptions of the crater. Relatively large numbers of small shocks around Mauna Loa are recorded most of the time. When these become more intense, it generally indicates that lava soon may pour forth again.

Between the tilt and tremor calculations, scientists can usually let the world know sometime ahead of an eruption that the big mountain will be active soon.

Main danger from Mauna Loa is that lava flows may hit villages on the island or its main city, Hilo. But this can now be averted by bombings which are used to break up the channels formed by the molten lava.

A few relatively small bombs have successfully diverted the flow from Hilo before. This incidentally, does not mean that bombs can set off a peaceful volcano, a tactic suggested during World War II. Scientists do not think it would be practical.

Science News Letter, January 22, 1949

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• New Machines and Gadgets •

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COMB-BRUSH CLEANING device, to hang in the bathroom, has a tape of the conventional threaded type for cleaning the comb, and a plastic wide-toothed comb for use in cleaning the hairbrush. The smooth-surfaced plastic used will not snag brush bristles nor will its light weight impair their resiliency.

Science News Letter, January 22, 1949

PEEPHOLES for apartment house doors are made with a recently developed "one-way" glass through which the person on the inside can see out, but which is a mirror to the visitor on the outside. The device is a door fixture, with a polished brass frame, that can easily be installed in any type door.

Science News Letter, January 22, 1949

COMPLETE BATHROOM is factory-constructed and equipped, and shipped as a unit ready to attach as an ell to an existing building, particularly to farm and suburban homes. It contains conventional materials and equipment, all in permanent place, and all necessary fixtures and fittings for immediate installation and use.

Science News Letter, January 22, 1949

COMBINATION SCREWDRIVER and hammer, shown in the picture, has a revolving flat metal disk at the upper end

so that the shaft can be spun without raising a blister on the palm of the hand. The movable hammer head, which can be fixed anywhere along the shaft by a set-screw, may also be used as a fist-grip for stubborn screws.

Science News Letter, January 22, 1949

CIGARETTE LIGHTER, with a transparent plastic reservoir through which the fuel level can be always noted, eliminates running out of fluid. Because of the material used, it is lighter in weight than metal lighters.

Science News Letter, January 22, 1949

ELECTRIC FAN, for home and office use, is in a housing which is mounted on a horizontal axis in a heavy, molded-plastic, cabinet-type base as a cradle. This new mounting arrangement permits finger-tip directional control of the air flow from horizontal to vertical.

Science News Letter, January 22, 1949

SELF-RECORDING GAGE, to measure the total impulse per unit area generated by pressure waves from underground explosions, is designed to be lowered into a well or drill hole or to be connected to a pressure chamber.

Science News Letter, January 22, 1949

EXPANDED-SCALE voltmeter quickly and easily tests automobile batteries, giving readings in percentage rather than in specific gravity. Variations between cell readings indicate the battery is headed for trouble, the nearness of which is shown by the amount of variation.

Science News Letter, January 22, 1949

Do You Know?

Per capita use of *sugar* in the United States is nearly 100 pounds a year.

American *automobile* and other motor vehicles produced in 1948 are 76,000 less in number than the 5,358,000 built in 1929; greater production for 1949 is promised.

"Sleeperettes" are now available on some of the long-distance, over-night passenger airplanes; they are seats that stretch out nearly flat to permit comfortable sleeping.

Ultrasonic refers to sound waves too high-pitched to be audible by the human ear; *supersonic* refers to any speeds faster than that of sound, which is about 760 miles an hour at sea level.

Modified air is being used experimentally in refrigerator cars to aid in keeping fruit in good condition during shipment; it is modified by cutting its normal 21% oxygen content to 5% or by adding carbon dioxide.

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